

Attorney Docket No. 06816-073003
Serial No. 09/933,684
Amendment dated July 7, 2004
Reply to Office Action dated April 7, 2004

Amendment to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-2. (cancelled)

3. (currently amended) A method of forming a membrane electrode assembly, comprising:

obtaining a solid-electrolyte membrane;

first, ~~treating~~ conditioning the membrane ~~with a swelling agent, to swell the membrane to form a swelled membrane using a~~ conditioning agent which reduces wrinkling of the membrane during swelling;

after said ~~treating~~ conditioning, applying a catalyst ink which includes platinum directly onto a first surface of said ~~swelled~~ membrane;

second applying a second catalyst ink which includes platinum directly onto a second surface of said ~~swelled~~ membrane;

first placing a first support substrate on said first surface of said membrane;

second placing a second support substrate on said second surface of said membrane; and

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bonding said first support substrate, said membrane, and said second substrate forming a membrane electrode assembly.

4. (original) A method as in claim 3, wherein said first applying is pouring said first catalyst ink onto said membrane.

5. (original) A method as in claim 3, wherein said second applying is pouring said second catalyst ink onto said membrane.

6. (currently amended) A method as in claim 4, wherein said first catalyst ink is formed from a mixture having about 7-10% catalyst, about 60-70% of ~~NAFION(TM)~~ a solution of co-polymer of TFE and fluorosuphonyl monomer, 15-20% of PTFE[[-30]] that is diluted to 11% in solids, and a viscosity adjusted for pouring.

7. (currently amended) A method as in claim 5, wherein said second catalyst ink is formed from a mixture having about 7-10% catalyst, about 60-70% of ~~NAFION(TM)~~ a solution of co-polymer of TFE and fluorosuphonyl monomer, 15-20% of PTFE[[-30]] that is diluted to 11% in solids, and a viscosity adjusted for pouring.

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8. (original) A method as in claim 3, wherein said first support substrate is carbon paper.

9. (original) A method as in claim 3, wherein said second support substrate is carbon paper.

10. (original) A method as in claim 3, wherein said first applying is spraying said first catalyst ink onto said membrane.

11. (original) A method as in claim 3, wherein said second applying is spraying said second catalyst ink onto said membrane.

12. (currently amended) A method as in claim 10, wherein said first catalyst ink is formed from a mixture having about 7-10% catalyst, about 60-70% of ~~NAFION(TM)~~ a solution of TFE and fluorosulphonyl monomer, 15-20% of PTFE[[-30]] that is diluted to 11% in solids, and a viscosity adjusted for spraying.

13. (currently amended) A method as in claim 11, wherein said second catalyst ink is formed from a mixture having about 7-10% catalyst, about 60-70% of ~~NAFION(TM)~~ a solution of TFE and

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fluorosulphonyl monomer, 15-20% of PTFE[[-30]] that is diluted to 11% in solids, and a viscosity adjusted for spraying.

14. (previously presented) A method as in claim 3, wherein said swelling comprises soaking the membrane in a combination of water and an aliphatic alcohol.

15. (previously presented) A method as in claim 14, wherein said swelling comprises solutions between 10% and 90% of isopropanol in water.

16. (previously presented) A method as in claim 3, wherein said first and second applying comprises applying catalyst at a level of 2 to 3 mg per centimeter squared.

17. (New) A method comprising:
forming a membrane of a material which would wrinkle during specified processing;
pretreating the membrane in a way to reduce wrinkling of the membrane during subsequent processing;
after said pretreating, swelling the membrane;
applying a catalyst which includes platinum, directly to the swelled membrane; and

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binding the membrane with platinum attached, to another material.

18. (New) A method as in claim 17, further comprising:
after said applying a catalyst, drying surfaces of said membrane using a controlled evaporation.

19. (New) A method as in claim 18, wherein said controlled evaporation comprises controlling an amount of liquid which can evaporate in a specified time.

20. (New) A method as in claim 17, wherein said pretreating comprises soaking in a solution of 50% alcohol for 24 hours.